

BOOK REVIEWS

NUCLEAR CARDIOLOGY. J. T. Willerson, ed. Philadelphia, F. A. Davis Co., 1979, 247 pp, illustrated, \$35.00.

NUCLEAR CARDIOLOGY is a well-written, concise compendium of chapters that covers a wide range of topics in nuclear cardiology. Each chapter has been contributed by one or more recognized experts in the field, and the work is thoroughly referenced. The physics and physiology of nuclear cardiology, myocardial imaging with Tl-201 and Tc-99m pyrophosphate, left ventricular and right ventricular function, measurement of coronary blood flow with Xe-133, and microspheres are discussed, and there are chapters on metabolic imaging with positron emitters and on transmission computerized tomography of the heart.

Budinger's 70-page chapter, "Physics and Physiology of Nuclear Cardiology" is especially good, since it discusses in detail the radionuclides used in nuclear cardiology, several detection systems, including the positron cameras, the principles of flow measurements, the principles of myocardial metabolism assessed by radionuclides, and radionuclide angiocardiology, including shunt quantitation. As the title suggests, the chapter blends the basic aspects of both physics and physiology and provides one of the best summaries of this area to be found in current literature. The bibliography contains 134 references.

The chapter by Berger and Zaret on right ventricular function is also excellent. These authors thoroughly discuss the difficult geometry of the right ventricle and then emphasize first pass techniques for determination of left and right ventricular ejection fraction. They do not deal with gated blood pool methods for determining right ventricular function. Buja's chapter on the pathophysiology of myocardial imaging agents is also well done. Throughout the book there are numerous tables and illustrations. The figures are reproduced well and chosen to clearly illustrate the intended points.

There are no major deficiencies in the book, but some minor problems are evident. Beller's chapter on positron emission imaging follows a more specific chapter by Weiss and Sobel on myocardial imaging with labeled fatty acids. Since Dr. Beller's chapter is more basic and general, it would appear to have been more appropriate for it to precede the chapter on fatty acid myocardial imaging. The last section in Beller's chapter comments on the work of Nichols et al. in the detection of pulmonary emboli by $C^{15}O_2$ inhalation. He correctly points out that the results with CO_2 inhalation were superior to those obtained with Xe-133 ventilation-perfusion imaging; however, the sensitivity (0.71) and specificity (0.64) quoted for Xe-133 ventilation-perfusion imaging are substantially lower than most other current series. These differences can be explained on the basis that these patients were in a subset selected for CO_2 inhalation because their V-P images were difficult to interpret. This point, however, is not made in this review. Since this book will likely be read by cardiologists who may not be aware of the other current literature on V-P imaging in pulmonary emboli, they may be misled by these figures for V-P imaging.

There are virtually no typographical errors or omissions in the text, but in Jones's chapter on congenital heart disease, the portion of Figure 8 that was chosen to show the radionuclide angiocardio-gram images on page 234 was omitted.

The index for the book is relatively brief, so the reader will need

to use the table of contents and chapter titles to find specific points of information.

These deficiencies are relatively minor, when one considers that most of the information is presented in a concise, well-written manner. Since it appears in the CARDIOVASCULAR CLINICS series, it is probably aimed primarily at cardiologists and other clinicians; however, nuclear medicine physicians who practice nuclear cardiology will also find it useful. Since the book covers the basic aspects of myocardial physiology, physics, and pathophysiology thoroughly; nuclear medicine and radiology residents should also find it useful as an introduction to the field of nuclear cardiology.

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RADIATION DETECTION AND MEASUREMENT. Glenn F. Knoll. New York/Chichester/Brisbane/Toronto, John Wiley and Sons, 1979, 816 pp, illustrated, \$29.95.

One of two purposes of this book is to serve as a textbook for a course in nuclear instrumentation or radiation measurements at the advanced undergraduate or beginning graduate level. More material is included than could possibly be covered in a one-year course, and this was done so that the book could serve its second purpose—as a general review or reference for experienced professionals who are actively involved in radiation measurements. It should satisfy both purposes admirably.

The first 150 pages are devoted to radiation sources, radiation interactions, general properties of radiation detectors, counting statistics, and error prediction. Units of measurement are included, and numerical values and examples are given that provide the reader with a working knowledge as well as a theoretical one. Useful and thoughtful detail are included. For example, the author provides a simple, exact formula, which should replace the approximate formula which is currently used, to determine detector deadtime.

The central portion of the book details specific properties of the basic radiation detection devices, and covers gas-filled detectors, scintillation counters, semiconductor detectors, and neutron detectors. Excellent sections on gamma-ray spectroscopy and neutron spectroscopy are included. The traditional detection devices, such as the semiconductor diodes and lithium drifted detectors, are discussed. Newer devices are also described, i.e., the cadmium telluride detector and bismuth germanate, both of which recently seem to be creeping into the field of medicine.

The last section of the book covers detector electronics and pulse processing, including linear and logic pulse function and multi-channel pulse analysis. There is an additional chapter on background radiation and detector shielding and a short appendix on the biologic effects of radiation and exposure limits.

This book does not include any discussion of imaging devices, but it does contain all the necessary information on the basics of instruments and methods for the detection and measurement of